

REMARKS/ARGUMENTS

Claims 26-51 are pending in this application. By this Amendment, claims 26, 30, 38-48 and 50 are amended and claim 51 is added. Support for the claims can be found throughout the specification, including the original claims and the drawings. Withdrawal of the rejections in view of the above amendments and the following remarks is respectfully requested.

I. Rejection Under 35 U.S.C. §112, Second Paragraph

The Office Action rejects claim 30 under 35 U.S.C. §112, second paragraph, as allegedly indefinite. It is respectfully submitted that the amendments to claim 30 are responsive to the Examiner's comments, and that claim 30 meets the requirements of 35 U.S.C. §112, second paragraph. Accordingly, the rejection should be withdrawn.

II. Rejection Under 35 U.S.C. §102(b)

The Office Action rejects claims 26-29, 31, 33, 35-38, 40 and 42-44 under 35 U.S.C. §102(b) over Kumar, U.S. Patent Publication No. 2001/0038718. This rejection is respectfully traversed.

Independent claim 26 is directed to an apparatus for presenting a highly spatially accurate visualization of a scene from which measurements can be taken. Independent claim 26 recites that the apparatus includes at least one camera that records a plurality of frames of video images of the scene, and at least one sensor mounted in relation to the camera so as to record sensor data on positional characteristics of the at least one camera as the at least one camera is moved with respect to the scene. The apparatus also includes an image processor having a first module

that uses the recorded sensor data to compensate for an effect of the positional characteristics of the camera on the frames and provide corrected frames, and a second module that constructs an accurate mosaic from the corrected frames.

Independent claim 38 is directed to a method for presenting a highly spatially accurate visualization of a scene from which measurements can be taken. Independent claim 38 recites that the method includes recording a plurality of frames of video images of the scene using a camera, and recording sensor data on positional characteristics of the camera as the camera is moved with respect to the scene. The method also includes using the sensor data to compensate for the effect of the positional characteristics of the camera on the frames to form corrected frames, and constructing an accurate mosaic from the corrected frames.

Kumar neither discloses nor suggests the features of independent claims 26 and 38, or the respective claimed combinations of features.

Kumar discloses a geo-registration system 106 in which a mobile platform 102 captures current video images of a specific locale 104 within a larger area 108 and transfers the current images to a central system along a path 112. The geo-registration system 106 geo-registers the current video images to geodetically calibrated reference images stored within a reference database 110. A footprint of the current video is then overlaid on the reference imagery, and shown on a display 114. Reference information such as latitude, longitude, and elevation may also be overlaid to provide the viewer a comprehensive understanding of the locale 104 being imaged.

A more detailed functional block diagram of the geo-registration system 106 is shown in Figure 2 of Kumar. Figure 2 includes an optional video mosaic generation module 200 that allows input imagery to be applied directly to the geo-spatial aligning module 202 to process input imagery by aligning the collected current video images with corresponding images retrieved from a reference database module 204, and then merging the aligned images to form a video mosaic.

In either of these scenarios, Kumar's system 100 collects a sequence of frames (presumably, using a camera mounted on the mobile platform 102, as asserted in the Office Action), and then immediately creates a mosaic of the locale 104 from the collected frames, or from a single frame.

In contrast, the processor recited in independent claim 26, and the corresponding method steps recited in independent claim 38, do not require a database of previously collected images of a scene to provide corrected frames or images. Rather, in independent claims 26 and 38, sensor data is recorded by the camera as the plurality of frames of video images is collected, and that current, recorded sensor data is used to compensate for positional characteristics of the camera and to provide corrected frames in real time so that an accurate mosaic can be constructed. Kumar neither discloses nor suggests a processor having a first module that uses recorded sensor data to compensate for effects of positional characteristics of a camera on a plurality of frames, and that provides corrected frames, as recited in independent claim 26, and the corresponding method steps recited in independent claim 38.

Accordingly, it is respectfully submitted that independent claims 26 and 38 are not anticipated by Kumar, and thus the rejection of independent claims 26 and 38 under 35 U.S.C. §102(b) over Kumar should be withdrawn. Dependent claims 27-29, 31, 33, 35-37, 40 and 42-44 are allowable at least for the reasons set forth above with respect to independent claims 26 and 38, from which they respectively depend, as well as for their added features.

III. Rejection Under 35 U.S.C. §103(a)

The Office Action rejects claim 30 under 35 U.S.C. §103(a) over Kumar in view of U.S. Patent No. 6,694,064 to Benkelman. This rejection is respectfully traversed.

Dependent claim 30 is allowable over Kumar at least for the reasons set forth above with respect to independent claim 26, from which it depends, as well as for its added features. Further, Benkelman is merely cited as allegedly teaching the use of an altimeter, and thus fails to overcome the deficiencies of Kumar. Accordingly, it is respectfully submitted that claim 30 is allowable over the applied combination, and thus the rejection of claim 30 under 35 U.S.C. §103(a) over Kumar and Benkelman should be withdrawn.

The Office Action rejects claims 45 and 47-50 under 35 U.S.C. §103(a) over Kumar, in view of Linnett (“Underwater Video Mosaicing For Seabed Mapping”). This rejection is respectfully traversed.

Independent claim 45 is directed to a method of performing a survey in a fluid. Independent claim 45 recites that the method includes mounting a camera and a plurality of sensors on a platform capable of movement in the fluid, and moving the platform through the

fluid while recording visual images on the camera and recording sensor data relating to the attitude and distance of the platform from objects of interest within the fluid. The method also includes using the sensor data to compensate for changes in attitude and distance on the frames and providing corrected visual images relating to a fixed distance and attitude, and video mosaicing the images to form an accurate video mosaic as a visual image of the scene surveyed.

As set forth above, Kumar neither discloses nor suggests the features of independent claim 45, or the claimed combination of features. Further, Linnett is merely cited as allegedly teaching performance of a survey in a fluid, and thus fails to overcome the deficiencies of Kumar. Accordingly, it is respectfully submitted that independent claim 45 is allowable over the applied combination, and thus the rejection of independent claim 45 under 35 U.S.C. §103(a) over Kumar and Linnett should be withdrawn. Dependent claims 47-50 are allowable at least for the reasons set forth above with respect to independent claim 45, from which they depend, as well as for their added features.

The Office Action rejects claims 32 and 39 under 35 U.S.C. §103(a) over Kumar, in view of Hall (“Image Registration and Mosaicing Using a Self-Calibrating Camera”). This rejection is respectfully traversed.

Dependent claims 32 and 39 are allowable over Kumar at least for the reasons set forth above with respect to independent claims 26 and 38, from which they respectively depend, as well as for their added features. Further, Hall is merely cited as allegedly teaching the use of a self-calibrating camera, and thus fails to overcome the deficiencies of Kumar. Accordingly, it is

respectfully submitted that claims 32 and 39 are allowable over the applied combination, and thus the rejection of claims 32 and 39 under 35 U.S.C. §103(a) over Kumar and Hall should be withdrawn.

The Office Action rejects claim 46 under 35 U.S.C. §103(a) over Kumar, in view of Linnett, and further in view of Hall. This rejection is respectfully traversed.

Dependent claim 46 is allowable over Kumar and Linnett at least for the reasons set forth above with respect to independent claim 45, from which it depends, as well as for its added features. Further, Hall is merely cited as allegedly teaching pre-calibration of a camera, and thus fails to overcome the deficiencies of Kumar and Linnett. Accordingly, it is respectfully submitted that claim 46 is allowable over the applied combination, and thus the rejection of claim 46 under 35 U.S.C. §103(a) over Kumar, Linnett and Hall should be withdrawn.

The Office Action rejects claims 34 and 41 under 35 U.S.C. §103(a) over Kumar, in view of Ham, U.S. Patent Publication No. 2002/0101438. This rejection is respectfully traversed.

Dependent claims 34 and 41 are allowable over Kumar at least for the reasons set forth above with respect to independent claims 26 and 38, from which they respectively depend, as well as for their added features. Further, Ham is merely cited as allegedly teaching the use of phase correlation, and thus fails to overcome the deficiencies of Kumar. Accordingly, it is respectfully submitted that claims 34 and 41 are allowable over the applied combination, and thus the rejection of claims 34 and 41 under 35 U.S.C. §103(a) over Kumar and Ham should be withdrawn.

IV. New Claim 51

By this Amendment, claim 51 is added to the application. Claim 51 depends from claim 28 and further recites that the at least one sensor is a bathymetric sensor. It is respectfully submitted that new claim 51 is allowable for all the reasons discussed above in connection with claim 28, and for the additional features it recites.

V. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Serial No. **10/528,990**

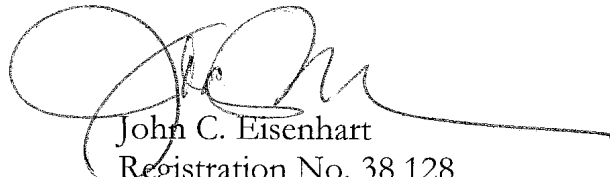
Docket No. **KC-0141**

Amdt. dated **January 21, 2008**

Reply to Office Action of **September 27, 2007**

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

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